Lucerne

Lucerne Overview

Volunteer monitoring began at Lake Lucerne in the 1980s and continued through 2004, with a gap in the early 1990s. The data indicate that this city lake (Maple Valley) is relatively low in primary productivity (oligotrophic - mesotrophic) with good to excellent water quality.

Lake Lucerne has no public access boat launch, but does have a history of both milfoil and *Hydrilla* infestations for which eradication efforts have been underway since 1995. Lake users and residents should keep a close eye on aquatic plants growing nearshore to catch new or expanding patches of these and other noxious weeds.

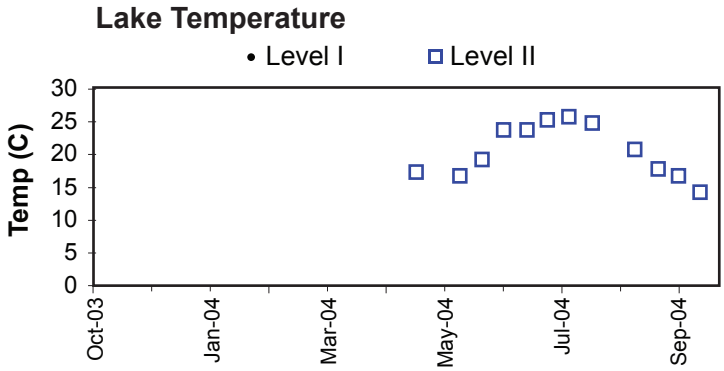
Physical Parameters

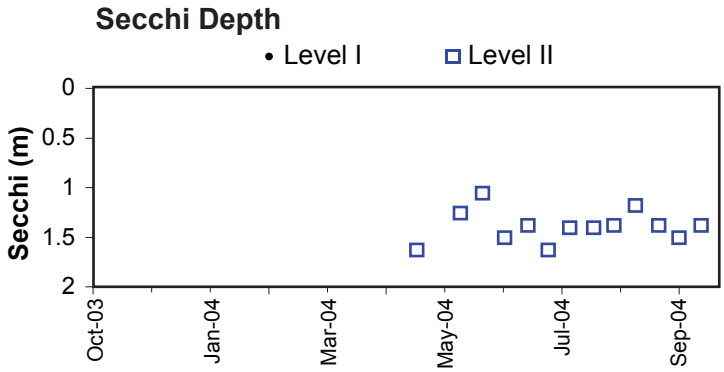
Secchi transparency ranged between 4.2 and 6.5m from April through October, averaging 5.6 m which was in the upper range for all the small lakes monitored in 2004. Surface water temperatures reached 26.0 degrees Celsius, which also put it in the upper range for summer maximum recorded among the group.

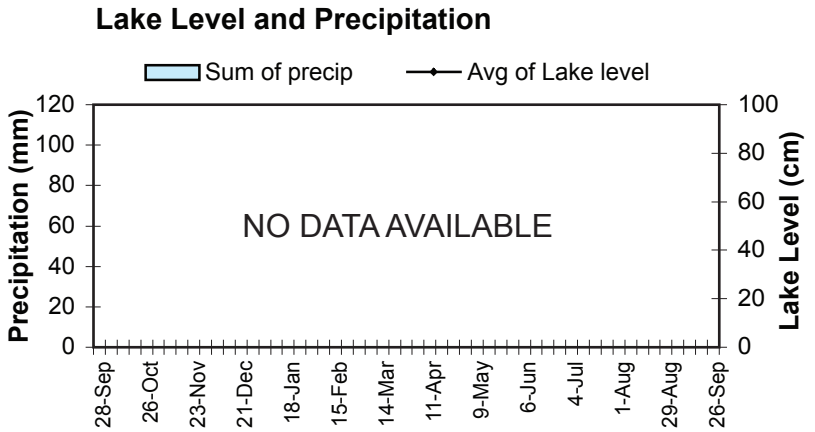
There were no precipitation or water level records, but records collected at Pipe Lake should be very similar.

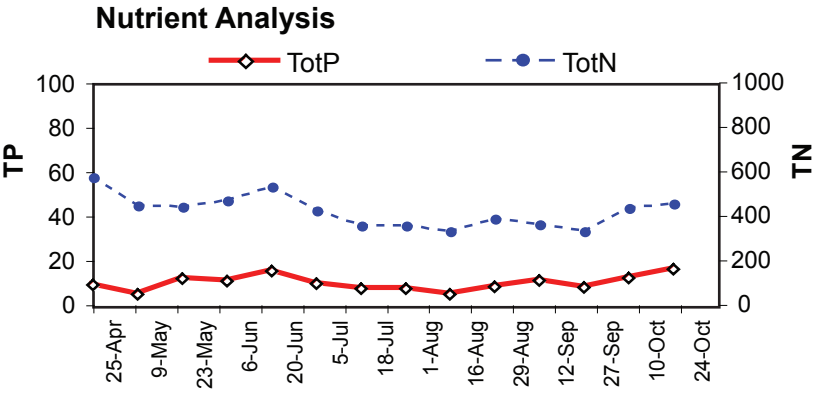
Nutrient Analysis and TSI Ratings

Total phosphorus and total nitrogen remained in generally consistent proportion to each other through the sampling period. The N:P ratio ranged from 28 to 91, averaging 47 which indicates poor conditions for growth of nuisance bluegreens.









Profile data indicate that thermal stratification was present early in the season and persisted through the summer. However, concentrations of phosphorus in the deep water remained relatively low, showing no signs of accumulation. Chlorophyll data indicated that algae were equally distributed through the shallow depths of the water column.

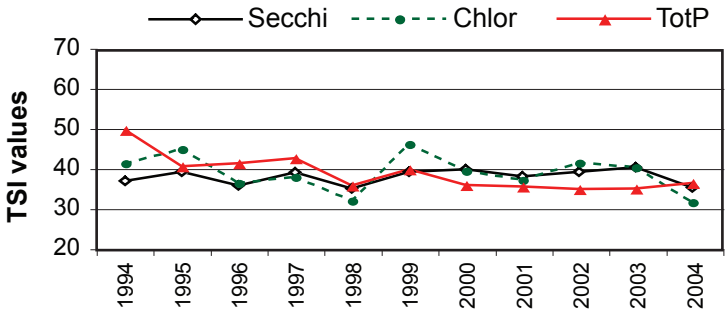
The 2004 TSI values were well below the threshold between oligotrophy and mesotrophy, lower than in past years.

Chlorophyll Concentrations and Algae

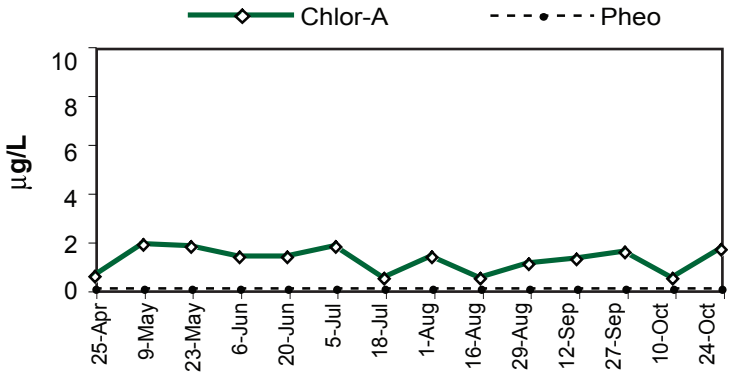
Chlorophyll remained at low values through the entire sampling period, never producing any peaks of note. The algae were characterized by a diversity of species, including colonial bluegreens such as *Anacystis* and *Snowella,* the chrysophyte *Dinobryon*, the diatom *Fragilaria crotonensis* and several unidentified chrysophyte species.

Date	Secchi	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/23/04	5.0	1	17.0	1.8	12.3	447
		6	11.5	2.08	8.1	61
		9	8.0		12.8	540
8/29/04	5.5	1		1.10	8.4	395
		6	19.5	1.40	8.9	420
		9	10.0		19.8	380

TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common Algae

	Group
colonial Palmellaceae (sph)	Chlorophyta
Dinobryon divergens	Chrysophyta
Snowella spp	Cyanobacteria

Lucerne

2004 Level I Data not available

2004 Level II Data

Date (2004)	Temp (°C)	Secchi (m)	Chl-*a* (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI		
								Secc	chl-a	TP
25-Apr	17.5	6.5	<detect	9.4	582	1	62	33.0	25.6	36.5
9-May	17.5	5.5	1.90	<detect	454	1	91	35.4	36.9	27.4
23-May	17.0	5.0	1.80	12.3	447	1	36	36.8	36.3	40.4
6-Jun	19.5	4.2	1.40	11.0	477	1	43	39.3	33.9	38.7
20-Jun	24.0	6.0	1.40	15.5	539	1	35	34.1	33.9	43.7
5-Jul	24.0	5.5	1.80	9.9	430	1	43	35.4	36.3	37.2
18-Jul	25.5	6.5	<detect	7.6	364	1	48	33.0	23.8	33.4
1-Aug	26.0	5.6	1.40	7.7	363		47	35.1	33.9	33.6
16-Aug	25.0	5.6	<detect	<detect	336	1	67	35.1	23.8	27.4
29-Aug	NR	5.5	1.10	8.4	395	1	47	35.4	31.5	34.8
12-Sep	21.0	4.7	1.30	11.3	367		32	37.7	33.1	39.1
27-Sep	18.0	5.5	1.60	8.1	336	1	41	35.4	35.2	34.3
10-Oct	17.0	6.0	<detect	12.6	441	2	35	34.1	23.8	40.7
24-Oct	14.5	5.5	1.70	16.5	462	1	28	35.4	35.8	44.6

	Temp (°C)	Secchi (m)	Chl-*a* (µg/l)	TP (µg/l)	TN (µg/l)	Algae	N:P	Calculated TSI		
								Secc	chl-a	TP
Mean	20.5	5.5	1.5	10.9	428.1	1.0	47	35.4	31.7	36.6
Median	19.5	5.5	1.5	10.5	435.5	1	43	35.4	33.9	36.8
Min	14.5	4.2	1.1	7.6	336.0	1	28	33.0	23.8	27.4
Max	26.0	6.5	1.9	16.5	582.0	2	91	39.3	36.9	44.6
Count	13	14	10	12	14	12	14	14	14	14

TSI Average = 34.5